



Visualisation of Street Sounds of Kolkata :

An immersive virtual experience

Design Research Seminar Project Report

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Declaration:

We declare that this written document represents our ideas in our own words and where others' ideas or words have been included, we have adequately cited and referenced the original sources.

We also declare that we have adhered to all principles of academic honesty and integrity and have not misrepresented or fabricated or falsified any idea/data/fact/source in my submission.

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Approval Sheet:

The project titled *Visualisation of Street Sounds of Kolkata : An immersive virtual experience*, is approved for partial fulfilment of the requirement for the degree of 'Master of Design' in Interaction Design.

Guide :

Date :

Acknowledgement:

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Parents, for supporting us throughout the stay.

Akshay Kore & Jayati Bandyopadhyay.

*“So in the streets of Calcutta I sometimes imagine myself a foreigner,
and only then do I discover how much is to be seen, which is lost so long
as its full value in attention is not paid. It is the hunger to really see
which drives people to travel to strange places.”*

- Rabindranath Tagore

Contents :



Figure 1. M G Road, Barabazar Source : Wikimedia

Abstract :

The project that initially started with the aim of visualizing the street sounds of Kolkata turned into the creation of an immersive exploration of the city by means of Virtual Reality. This was done through a series of ideas and design decisions based on the experience, scalability, replicability and in many cases the cost, time and constraints of current technology. The creators went on 15 day journey of collecting data for various aspects of the city which included ambient and characteristic sounds, images, textual information and 360 degree views.

The creators wanted to bring out a feeling of nostalgia for the ones who live or have lived before in Kolkata; even experience parts of the city before visiting them for 'real'. The creators believe that VR as a medium is yet to develop a lot more before it gives a 'real experience' of the real. Yet it is great to give one a partial experience of the place.

This partial experience is created through a Virtual Reality application that enables one to experience certain parts of the city from the comfort of their locale.



Figure 2. Ganges from Princep Ghat

Introduction :

The City of Kolkata has a long tradition of spawning writers, filmmakers, artists, thinkers, intellectuals of great recognition and vigour. A number of us know the city from the eyes and descriptions from their work. Much of us know the city for its food and culture. The sounds of its streets bring back memories, instil new ones and create a lasting remembrance of the land. Sound is a way of experience. Seeing the city in a new light. This project aims to partially recreate the experience of being in the streets of Kolkata by means of a technology intervention. Enabling one to experience the city by visualizing its street sounds through the medium of Virtual Reality. The creators went on a fifteen day journey through the city streets, capturing sounds, images, 360degree views with the hope to trigger memories, create new ones and instil nostalgia through the visualization created. The project is dedicated to the people of Kolkata wanting to experience 'home' a little bit differently.



Figure 3. Esplanade Source : Wikimedia

Places :

The city of Kolkata is divided into 3 parts viz. North Kolkata, Central Kolkata and South Kolkata. It was thought that certain places in Kolkata would have peculiar sounds that distinguish them from the rest of the city. The sounds at these locations were characteristic of their divisions in the city, the history and livelihoods. The team captured sound and image data for a total of thirteen locations as shown in the adjoining figure.

North Kolkata

- Shyam Bazaar
- Ultodanga
- Boithak Khana
- Sealdeah
- College Street
- Bura Bazar
- Chandni Chawk

Central Kolkata

- Rabindra Sadan
- Esplanade Market
- Red Road
- Princep Ghat
- Victoria Memorial

South Kolkata

- Gariahat
- Ballygunge
- Tollygunge
- Garia
- Dhakuria
- Netaji Bhavan



Figure 3.1. Google Map (Map Not to Scale)



Figure 4. Manikata Source : Wikimedia

North Kolkata



Figure 5. Shyam Bazar 5 point

North Kolkata Street Sounds :

This is the older part of the city characterized by dense street structures, closely packed buildings with a good mix of residential, educational and commercial areas. This part is primarily known for its educational institutions and is throbbing with a crowd of college going students. It is dominated by narrow little lanes and hundreds of century-old buildings.

The northern part of Kolkata includes Chitpur, Bagbazar, Belgachhia, Shyambazar, Shobhabazar, Maniktala, Jora Sanko and the famous College Street area. Also situated here are the Sealdah station, one of the largest train hubs in India, and the newly built Kolkata station.

The streets in North Kolkata are abuzz with sounds of cycle rickshaw pullers, roadside book vendors, trains, buses, traffic.

One cannot miss the sounds of vendors and customers on the roadside markets. The street sounds of North Kolkata have still managed to preserve the typical soundscape. Akashvani news played by households, children reading out loud verses of poetry or practicing music at home along with the sound and aroma of food being prepared in the morning; rickshaws, hawkers, trams in busy streets throughout the day; children playing on streets, public meetings organised by political parties, conch from hindu households, azan played in mosques in the evening mixed with the mesmerising smell of incense sticks from closely constructed households is overwhelming for both visitors and residents alike.

Data Captured

Images, 360 Degree Images, Sound clips



Figure 5, 6. (left to right) Top view of North Kolkata, Sealdah bridge.



Figure 7. Central Kolkata typical street Source : BongAppetite

Central Kolkata



Figure 8. Central Kolkata Tram Service

Central Kolkata Street Sounds :

This area in the heart of the city near the west banks of the River Hoogly. It is primarily an office and market area. It is frequented by a number of tourists along with the regular office goers and consists of a number of hotels and restaurants.

The streets sounds are characterized by the constant buzzing of traffic, trams, taxis, the bazaar sounds of street vendors selling everything from daily items, fashion, clothes, books, toys etc. The intensity of the sounds generally goes up during late mornings and late evenings and gradually reduces late in the night. This part of the city wakes up early morning with vendors supplying goods to different shops, school and college going students. The city houses the first medical college in India known for its treatment facilities. People travel to this part of the city for varied business and personal

reasons. A substantial part of central Kolkata is completely used for commercial purposes with very little residential buildings. This area hence sleeps early as compared to the northern part of the city.

Data Captured

Images, 360 Degree Images, Sound clips

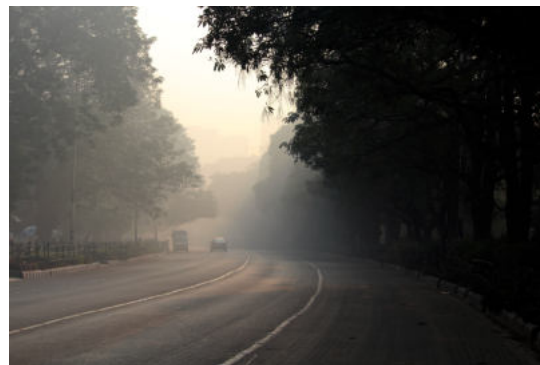


Figure 9, 10, 11. (left to right) Esplanade during Ramadan, Red road in the morning, Hand-pulled rickshaw puller in esplanade.



Figure 12. South Kolkata Skyline

South Kolkata

South Kolkata Street Sounds :

This is a posh area of the city with lush green spaces, museums, galleries and is always abuzz with a tourist population. It is quieter than the rest of the city with mild sounds of traffic, cars, taxis, cycle rickshaws, tourist buses, street vendors etc. at certain locations. The mornings are low on intensity of sound with birds chirping, people jogging near lakes and occasional laughters from laughing club members. The southern part of the city mostly comprises of apartments in high-rises. The sound is typically low in this part of the city except for the main roads. Occasional presence of on-the-wheels vendors and rickshaw horns in some parts of this half of the city are the only characteristic sounds.

Data Captured

Images, 360 Degree Images, Sound clips.



Figure 13,14. (left to right) South Kolkata skyline, Dhakuria - Southern part of Kolkata.

Capturing Data :

The team decided to use only a phone and a DSLR Camera to capture data. The sounds were captured using the recorder on an off the shelf android phone. Images were clicked using a DSLR Camera. The photospheres 360degree images were captured with an Android phone with a gyroscope using the Google Camera application.

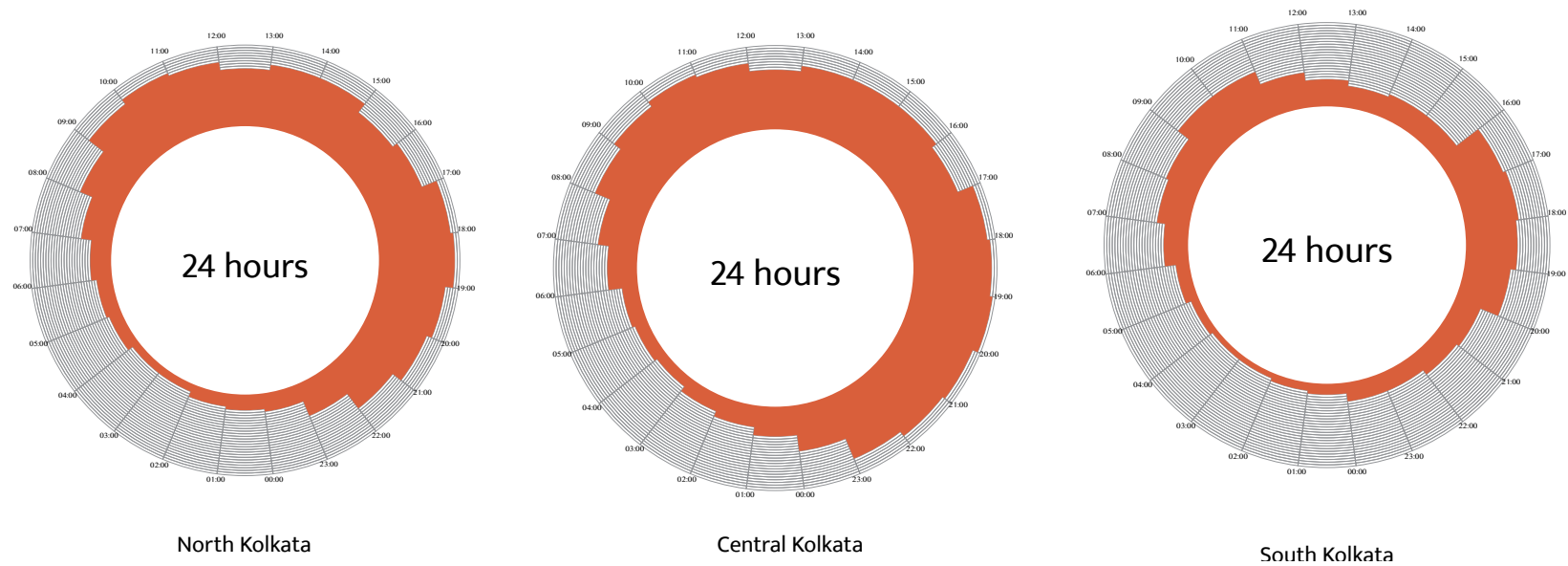


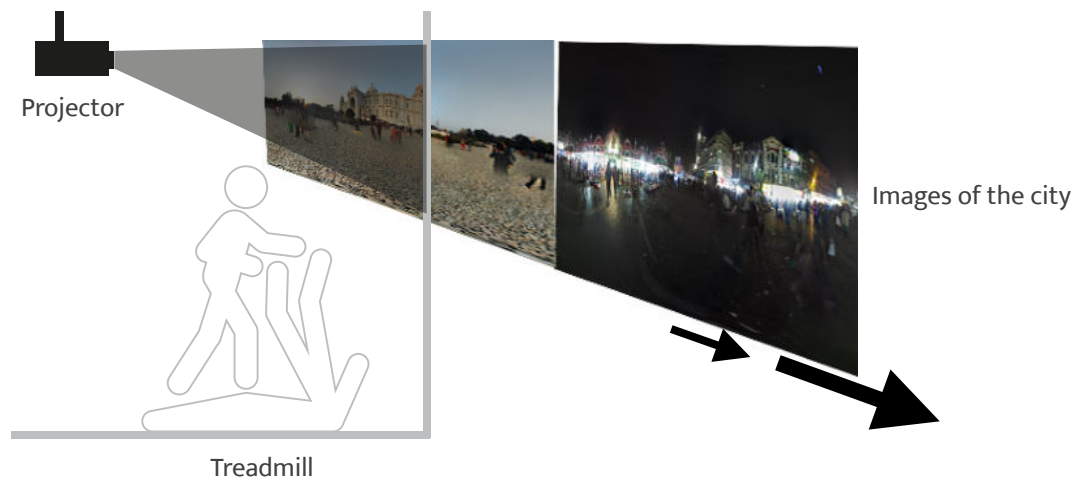
Fig. 15. 24 hour Intensity of sound in North, Central and South Kolkata (Schematic)

Immersive Experience Ideas :

Walking through the city

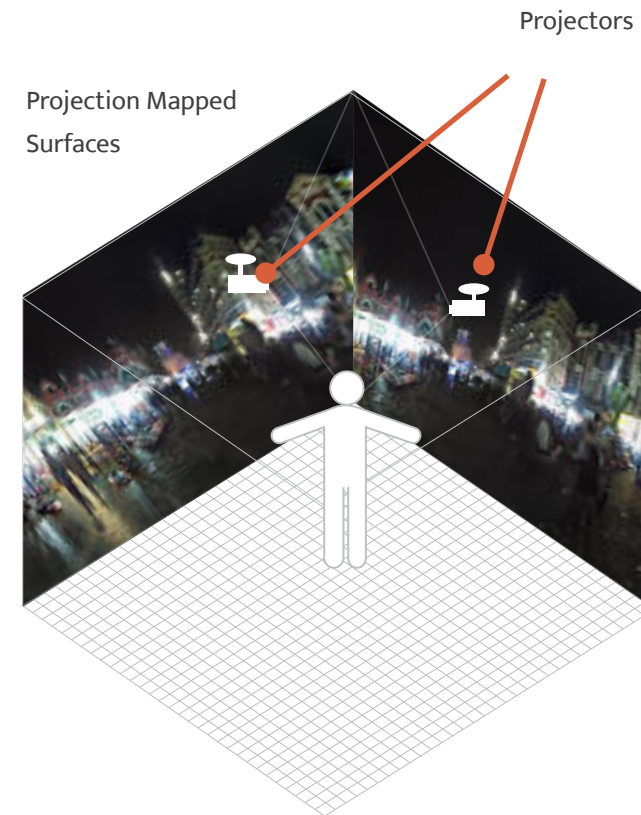
This idea involved the use of a treadmill to give the user an experience of walking in the city. As the user walks on the treadmill, the projection on the wall changes into different images of the city turning it into a continuous journey through the city with a continuous track of the street sounds playing in the background.

However, this was discarded since the equipment was expensive and difficult to procure. Along with this, it is only a single person experience with issues of replication and scalability of the idea.



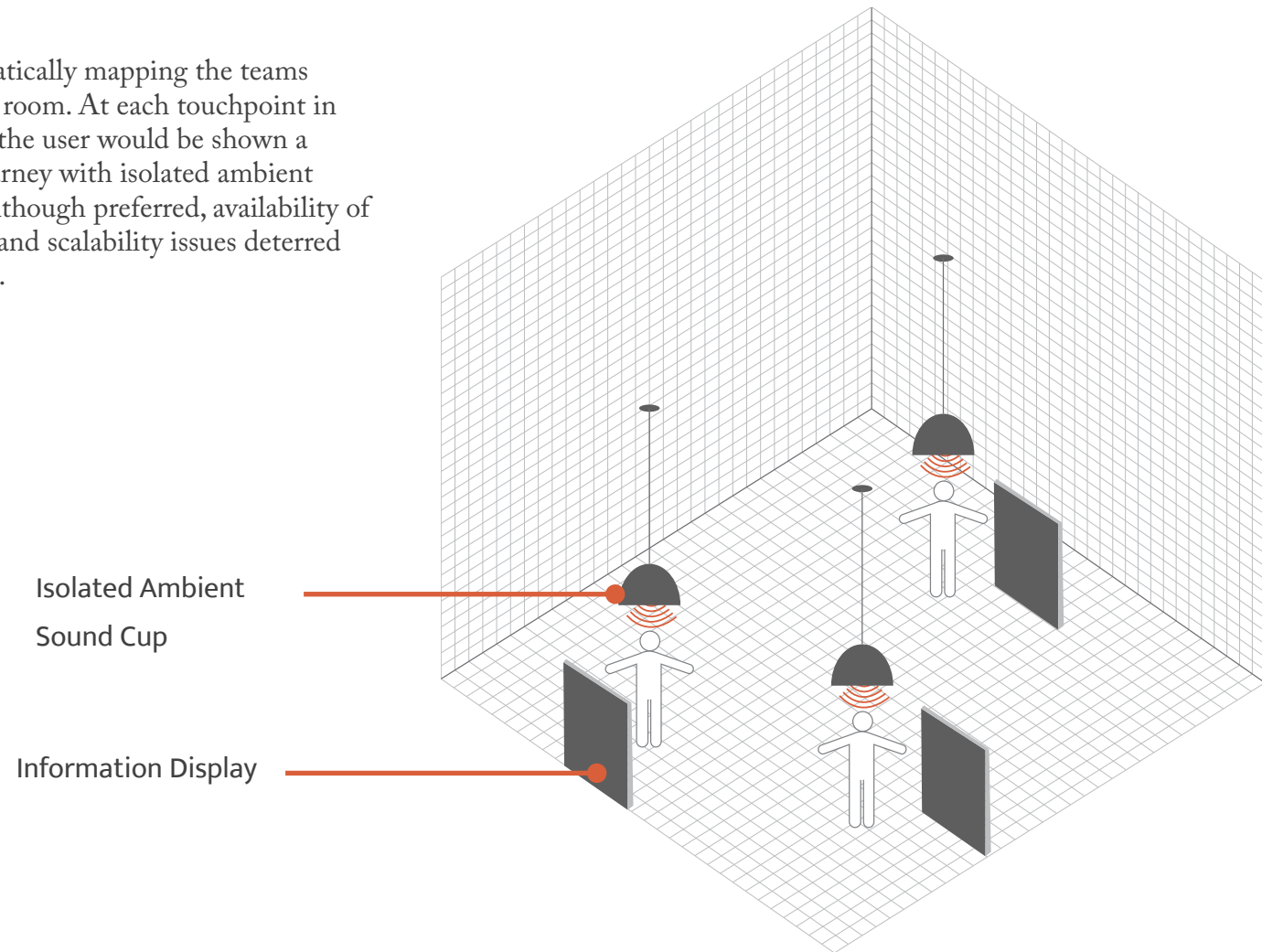
City Experience with Projection Mapping

The user is in the centre of a room with the walls of the room projected with accurate to scale representations of areas in the city. The projections are mapped on the walls to give the user an experience of being at the location along with sounds at the locations playing in the background. Although collaborative in nature, the idea was not thought to be novel enough to be pursued and was quickly discarded.



Sound Spaces

This idea consisted of schematically mapping the teams journey in Kolkata in 10'x16' room. At each touchpoint in the journey inside the room, the user would be shown a poster with images of the journey with isolated ambient sound in the background. Although preferred, availability of a large space and replication and scalability issues deterred the team away from this idea.

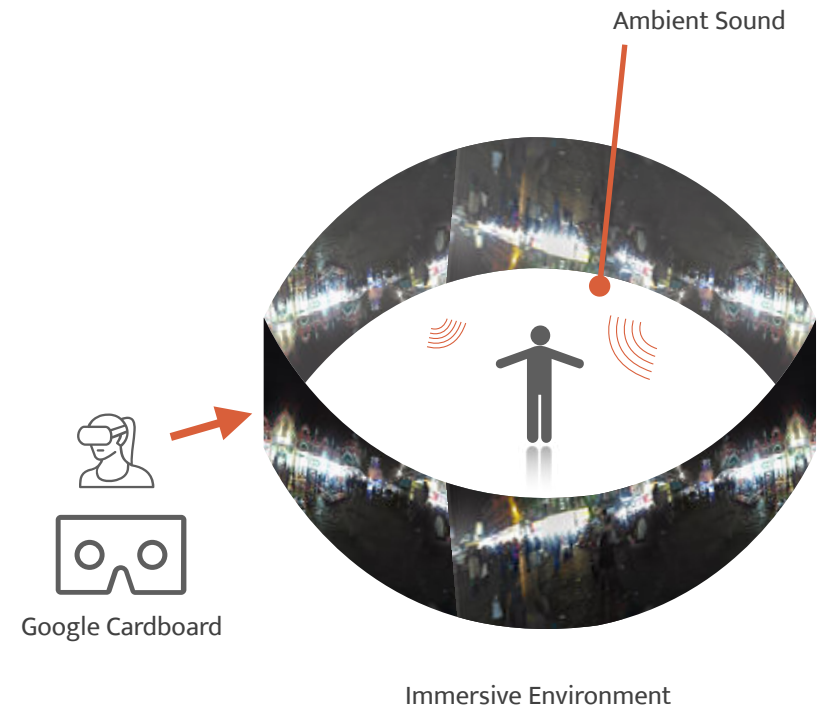


Final Idea : VR Kolkata

The team always felt that Virtual Reality would be a great medium to showcase the city and make the users experience the city more intimately. The idea consists of creating an immersive visualisation of the team's journey through a Virtual Reality application. The sounds captured at these locations are mixed into a track which plays in the background giving the user a feeling of being at the place. Although not collaborative, this inexpensive idea has high levels of ubiquity, scalability and replicability.

The sounds were mixed to create a journey experienced throughout the day by a person living in the northern part of the city, which still stands out in its uniqueness of sounds in spite of the city's metropolitan influence. Some of the 360 images once imported into Unity, it was realised that the resolution of the captured images were not high enough. The images were pixelated in the prototype. Hence, similar images were searched and replaced with better quality images from the internet.

The prototype was build using Unity 3D and sounds were mixed using Audacity.



Prototype :

The prototype had 4 scenes :

1. Early morning.
2. Morning vegetable and market.
3. On the way to work.
4. Evening post work stroll.

1. Early morning :

The early morning sounds are a mix of radio news telecast, birds chirping, garbage collecting van whistles, carpenter working nearby, child practicing songs. The audios were arranged such that distinct sounds like radio telecast, child practicing songs were sequentially arranged while ambient sounds were situated and repeated in the background across the entire clip.



Figure 20 Morning scene. Credits: Humayunn Niaz Ahmed Peerzaada.

2. Morning market :

The sounds for this scene comprised of cycle rickshaw horns depicting the way to market, paper man and street hawkers, bargaining in vegetable and fish markets. The journey had a pace, starting from mild conversations and ambient sounds to high pitched bargain conversations.



Figure 21. Market scene. Credits: Humayunn Niaz Ahmed Peerzaada.

3. On the way to work:

The visual of this scene was selected as the interior of a tram, a two compartment train plying through the streets of central Kolkata. The sounds depicted a journey from home to work, both being in the old part of the city. The journey starts with a bus journey, followed by a short journey in train and walking through the old office streets of Kolkata. The sounds in this scene consist of bus conductors shouting destination names, ambient traffic, radio playing in vehicles, hand-pulled rickshaw horns, cart pullers and hawkers shouting, train stations and random conversations inside the train.



Figure 22 On the way to work. Credits: Humayunn Niaz Ahmed Peerzaada.

4. Post work stroll:

This scene is a evening stroll through the streets of Esplanade and depicts a religious harmony within the city. Prayers chanted, drum bits along with the ambient sounds of tram and hawkers bring out a typical old Kolkata evening ambience.



Figure 23 Post work stroll, Esplanade.

Unity cardboard plugin was used to create the experience. The scenes were converted into spherical materials within Unity and one single track was added to each scene. The scenes changed automatically once the entire sound was played. The users were also given an option to go back and forth, the options being provided on the floor. An android application was built from the project and shown to multiple people and their expressions were captured.



Conclusion :

We have all been accustomed to experiencing places through their images, videos, documentaries or better yet by being at the place. Virtual Reality as a medium presents a great possibility of experiencing our cities in a new light. A partial experience of reality. The streets of Kolkata are peculiar in the experience that they give a passerby. Sound of the streets is an important characteristic of this experience, Through this project the creators aim to give the viewer a newer way of experiencing the streets of Kolkata with the hope of creating an impression, a memory and a feeling of nostalgia.

